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**KEY DETERMINANTS OF
BREASTFEEDING SUCCESS IN INFANTS BORN
BEFORE 30 WEEKS GESTATION**

A thesis presented in partial fulfilment of the requirements for the degree
of Master of Philosophy at Massey University, Auckland, New Zealand.

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2005

ABSTRACT

Breastfeeding is promoted at a public health level by many agencies internationally and nationally. While there is an abundance of literature to guide practice regarding breastfeeding term healthy infants, there is little regarding premature infants, particularly those born before 30 weeks gestation. Data on breastfeeding outcomes in this population is limited in the New Zealand literature. The aims of the study were to identify the breastfeeding outcomes of premature infants born before 30 weeks gestation; to identify key determinants that may contribute to the success of breastfeeding outcomes; and to describe the feeding practices of this population during hospitalisation and post-discharge.

This audit used a non-experimental, cross-sectional, descriptive, correlational design using pre-existing medical records, to obtain variables of interest. Independent variables included maternal and infant characteristic and infant feeding characteristic. Key determinant variables were identified as maternal support, maternal milk supply, kangaroo care and bottle use. Feeding problems and growth were also considered as independent variables.

Breastfeeding outcomes are comparable to the New Zealand population of breastfed infants in duration but not intensity of breast milk received. Maori and Polynesian infants have poorer breastfeeding outcomes compared to Caucasian and Asian infants and have higher rates of feeding problems. Further research is required to identify the cause of increased feeding problems in these cultures.

ACKNOWLEDGMENTS

The process of undertaking research can be a lonely journey at times however many people have helped and supported me along the way. Thanks to everyone who contributed and especially to the mothers and babies entrusted to my care. I am in awe of the challenge that mothers who deliver early endure and am reaffirmed by the love and intimacy that evolves.

Thanks to Greg whose sense of humour made statistics fun, if that is possible.

Thanks also to Jean Bertram for checking data collection accuracy. Also for your support and wisdom during my time in the NICU.

I would like to express my gratitude to Jill Clendon, for providing such wonderful professional support and steering me in the right direction. The endless hours of reading drafts and your comments that always seemed so positive despite the many changes.

Thanks also to the academic staff of the department of Health Sciences at Massey University, Albany Campus.

Thanks to my friends who have supported me through the difficult last few months. You not only supported me emotionally, professionally but also gave me a roof over my head, a quiet place to work and nurtured me.

I am very appreciative of my family, especially my mother and father (Natalie and Alf) who gave such unconditional love throughout my life and continue to do so. The sacrifices you made for me are a gift I carry always.

My love and gratitude go to my husband, David. You have given me so much more than could ever be imagined or wished for. Thanks for supporting me in my passion and for believing in me.

Carol Thomas

March 2005

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CHAPTER ONE

INTRODUCTION

Neonatal intensive care is a relatively new discipline in medicine. It developed as a specialty around 30 years ago with the introduction of neonatal intensive care units (NICUs). The care of neonates has dramatically changed over this time with advances in medicine and technology. Infants of lower gestation are not only surviving but morbidity has been greatly reduced (Darlow, Cust, Donoghue, & on behalf of the Australian and New Zealand Neonatal Network (ANZNN), 2003). Despite this there are many challenges to the care of the premature infant and breastfeeding is one of them. Backwell-Sachs and Blackburn (2003) suggest that the spectrum of care for premature infants is wide ranging. It includes the perinatal period, neonatal intensive care, transition to home, and the remaining first year of life. Breastfeeding premature infants also encompasses these periods and challenges remain in establishing evidence-based standards of care (Backwell-Sachs & Blackburn, 2003).

The breastfeeding outcomes of premature babies in New Zealand have been poorly documented and/or poorly defined in the literature. Internationally there is a gap in the literature regarding babies born before 30 weeks gestation. The determinants of breastfeeding success in this population have not been adequately assessed. In the New Zealand context, with its unique culture and high initiation rates of breastfeeding in general, there is little known of the breastfeeding outcomes in this population of infants. Data collection on breastfeeding outcomes for infants

hospitalised in neonatal intensive care units (NICUs) is not a requirement of the World Health Organisation (WHO), the New Zealand Ministry of Health (MOH) or the New Zealand Breastfeeding Authority (NZBA). Where data is collected there is a lack of consistency in the definitions of breastfeeding for term healthy infants as well as for NICU infants (Labbok, 2000; Labbok, Belsey, & Coffin, 1997; Nicoll & Williams, 2002). The data collection points suggested by several authors may also be inappropriate for the premature infant - this will be discussed further in chapter two.

Breastfeeding is the physiological norm for all infants (American Academy of Pediatrics, 2005; WHO/UNICEF, 2003). In particular breastfeeding is very important for infants born with very low birth weight (VLBW) because of their immaturity, increased risk of illness (including infection) and other benefits which have been scientifically shown to be advantageous in this group of infants (Brown, Meier, Spatz, Zukowsky, & Spitzer, 1996; Furman, Taylor, Minich, & Hack, 2003; Horwood, Darlow, & Mogridge, 2001). On the other hand, artificial baby milk (ABM) feeding may have serious consequences for these infants. It is fascinating that most scientists, when attempting to quantify the benefits of breastfeeding, tend not to regard breastfeeding and breast milk as the biological norms (Minchin, 1998). Despite this argument oral feeding may be difficult for VLBW and/or premature infants (Bartle, 2003a; Dawson & Benson, 2001; WHO/UNICEF, 1990, 2003).

Mothers who desire to breastfeed their premature or sick infants face many obstacles. Not only may they endure months of separation from their infant but they may also have to express breast milk for months before the infant even attempts to breastfeed (Morse & Bottorff, 1990). Neonatal intensive care units (NICUs) are

based on a medical paradigm and this conflicts with the intimate nature of breastfeeding, and indeed the mother and infant relationship (Levin, 1999). In the NICU an infant's feeding is often nurse driven and the power controls that surround this issue can be distressing and confusing for the mothers and infants (Spatz, 2004). Infant feeding practices in NICUs are often based on traditional beliefs from a bottle-feeding culture that is often in conflict with breastfeeding (Bartle, 2003a; Spatz, 2004). There is a strong movement nationally and internationally to support, promote and protect breastfeeding (MOH, 2002; NZBA, 2005; USA Department of Health and Human Services Office on Women's Health, 2000; WHO/UNICEF, 1990) and it has been stated that mothers of premature or sick infants should have skilled and appropriate lactation support during their postnatal care (American Academy of Pediatrics, 2005; California Perinatal Quality Care Collaborative, 2004; MOH, 2002; Morton, 2003; WHO/UNICEF, 2003).

The New Zealand Ministry of Health (MOH, 2002) equally acknowledges the special circumstances of infants who are admitted to neonatal intensive care units (NICUs). The MOH states that the lead maternity carer (LMC) and the specialist neonatal service are responsible for supporting breastfeeding. It also states that a woman who has complications may be referred to secondary maternity services and that breastfeeding issues that fall outside the usual breastfeeding problems are regarded as complications. Where there are complex breastfeeding problems the secondary maternity service is supposed to provide specialist breastfeeding advice to the LMC or directly to the woman (MOH, 2002). Anecdotally, while this is supported in theory, in practice it rarely occurs.

Establishing breastfeeding in the neonatal intensive care unit (NICU) is a complex issue and requires a holistic approach. Equal consideration must be given to the mother and the infant, which is not often the case in the NICU because of their physical separation. The literature around this topic is conflicting and difficult to interpret. Scientific research on breastfeeding term healthy infants may not necessarily apply to infants born prematurely. Conducting breastfeeding research in a bottle-feeding culture is also problematic. Attitudes of staff in the NICU will impact on breastfeeding outcomes. There are very strong beliefs (both negative and positive) held by NICU staff regarding breastfeeding. The most vulnerable of our infants, those born prematurely or sick, should not be disadvantaged just because they are born into a NICU environment.

STATEMENT OF THE PROBLEM

As a neonatal nurse and midwife working in the neonatal intensive care environment for over 20 years, I have been concerned about the mother-infant relationship. After qualifying as an International Board Certified Lactation Consultant (IBCLC) 10 years ago, it became apparent to me that breastfeeding was an important component in healing the grief associated with premature birth and restoring the mother-infant relationship. Breastfeeding in this population of infants appeared to be fraught with difficulties however. While there are many people who work within the NICU environment who promote and support breastfeeding, it appears that some of the embedded feeding practices may be contributing to the lack of *success* for many of these mother-infant dyads. There are conflicting messages that on the one hand promote breastfeeding with practices and advice that negatively support it.

The lack of evidence-based practice regarding infant feeding is a contentious issue (Minchin, 1998). While the message *breast is best* is the dominant discourse, it is not always supported in the clinical setting. During their time in the neonatal intensive care unit (NICU) infants are often exposed to several different types of milk and several different types of feeding methods. Mothers are given conflicting advice regarding establishing and maintaining a milk supply and may not feel like a mother at all because of separation from their vulnerable infant. There appear to be many factors that contribute to the success or failure of breastfeeding for these mothers.

The key concerns with studies to date are the lack of consistency in defining breastfeeding and data collection points, and the impact feeding problems and growth may have on breastfeeding outcomes. Breastfeeding definitions for this study can be found in appendix one. The definitions used include the proportion of breast milk feeding by the infant and the proportion of feeding at the breast. The issues of feeding problems and growth have also been addressed in the study by using them as variables for the research. These are rarely, if ever, addressed in the breastfeeding literature and appear to be significant problems for some infants born very premature.

The present study investigated the key determinants of breastfeeding outcomes in premature infants born before 30 weeks gestation in a large urban maternity facility. The conceptual framework that underpins this research is based on the Baby Friendly Hospital Initiative (BFHI) 'Ten Steps to Successful Breastfeeding' and is shown in appendix two (WHO/UNICEF, 1989). The background to the 'Ten Steps to Successful Breastfeeding' will be discussed in chapter two. All *ten steps* of the BFHI

have been validated in the literature (WHO, 1998a). The aim of the BFHI is to increase breastfeeding initiation and duration by reducing the hospital practices that have contributed to breastfeeding demise. Elements of the BFHI combined with an extensive review of the literature, have identified several key determinants that form the basis of the study hypothesis: maternal support, establishing an adequate milk supply, early and frequent skin-to-skin contact/kangaroo care (KC), and minimal use of bottles contribute to breastfeeding success in babies born before 30 weeks gestation.

STUDY AIMS

The main aims of the study are:

1. To identify the breastfeeding outcomes of premature infants born before 30 weeks gestation.
2. To identify key determinants that may contribute to the success of breastfeeding in this population of infants.
3. To describe the feeding practices of this population during hospitalisation and post-discharge.

It is assumed that the cultural and social influences of breastfeeding the term healthy infant will also be the same for the premature infant. So while some maternal demographic data was obtained, specific contributors such as maternal smoking, maternal education and socio-economic status were not addressed in this study. Rather, feeding practices and support variables were identified and outcomes determined at the time of discharge from hospital, discharge from homecare and first follow-up appointment with the neonatologist. Variables were obtained from the

neonatal database and the infant feeding charts.

CONCLUSION

The current chapter provides an overview of some of the issues concerning breastfeeding premature infants. Several of the key issues have been identified and form the basis of the research project. The research is underpinned by the Baby Friendly Hospital Initiative (BFHI) which will be elaborated upon in chapter two.

Chapter two provides a background to the study and a review of the literature on the topic of breastfeeding premature infants. An overview of the international and national situation regarding breastfeeding is explored. Justification for the active promotion of breastfeeding and how this relates to the NICU is discussed. Also within this chapter is the issue of defining breastfeeding. Several definitions will be explored and the definitions for this current study will be given. The issue of defining 'successful' breastfeeding is also explored.

Several key issues identified in the literature review will be addressed. Firstly an investigation into the breastfeeding outcomes of other NICUs internationally and nationally is undertaken. The issue of maternal support is also raised and while this is an enormous issue to discuss some key factors for the mother will be analysed. Establishing a milk supply is a key task that all mothers who wish to breastfeed their premature infants need to undertake and some of the issues around this will be discussed. Kangaroo care (KC) has been suggested to be helpful in establishing and improving a poor maternal milk supply. KC has also been suggested to be helpful for premature infants and their mothers in the transition to successful breastfeeding. The most suitable methods for transitioning premature infants to breastfeeding are

controversial and several novel methods have been investigated and will be elaborated on. Throughout the literature review analysis of the methods used for primary research and outcomes will be addressed.

Chapter three of this thesis is the methods chapter. Justification for the methods chosen to perform the study will be given and an overview of the study design.

Participant selection is highlighted, encompassing exclusions and inclusions and the rationale for each. The next issue addressed is the procedure: how the data was collected and cleaned and how missing data was dealt with. Following this is an explanation of how the data was analysed. Ethical considerations are addressed along with the reliability and limitations of the study. Definitions of 'success' in terms of outcome variables are also discussed.

Chapter four is the results section and presents the results of the study including descriptions of the maternal and infant demographics. The breastfeeding outcomes at the various data collection points will be shown along with the results of the key determinants. Chapter five, the discussion, analyses the results within the context of the literature. The discussion is also centred on the breastfeeding outcomes and the key determinants. The last chapter, six is the conclusion. A summary of what was achieved by the study, limitations of the study, implications for practice and further research recommendations are presented.